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Rev. 07/10/02

Second Five-Year Review Report

for

Bowers Landfill

Circleville

Pickaway County, Ohio

July 2002

PREPARED BY:

Ohio EPA
Diana L. Bynum
Columbus, Ohio

Approved by:

William Muno
Director, Superfund Division
U.S. EPA

Date: 8/23/02

Five-Year Review Report

Table of Contents

Tables

Attachments

List of Acronyms

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DDAGW	Division of Drinking and Ground Waters
HI	Hazard Index
MCL	Maximum Contaminent Level
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
Ohio EPA	Ohio Environmental Protection Agency
RD/RA	Remedial Design/Remedial Action
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SVOC	Semi-volatile Organic Compound
VOC	Volatile Organic Compound

Executive Summary

The remedy for Bowers Landfill in Circleville, Ohio, included capping of contaminated soils and debris on site, institutional controls, and monitoring of ground and surface water and methane and volatile organic compounds (VOCs). Construction was completed in September 1993. The trigger for this five-year review was the signature date of July 23, 1997 from the first five-year review.

The assessment of the five-year review found that the remedy was constructed in accordance with the requirements of the Record of Decision (ROD). Some changes in the design were made during construction. The remedy is functioning as designed. The immediate threats have been addressed and the remedy continues to be protective.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION

Site name *(from WasteLAN)*: Bowers Landfill

EPA ID *(from WasteLAN)*: OHD980509616

Region: Five	**State:** Ohio	**City/County:** Circleville, Pickaway

SITE STATUS

NPL status: ☐ Final X Deleted ☐ Other (specify) _____

Remediation status (choose all that apply): ☐ Under Construction ☐ Operating X Complete

Multiple OUs?* ☐ YES X NO	**Construction completion date:** 09 / / 1993

Has site been put into reuse? X YES NO

REVIEW STATUS

Lead agency: ☐ EPA X State ☐ Tribe ☐ Other Federal Agency _____

Author name: Diana L. Bynum

Author title: Site Coordinator	**Author affiliation:** Ohio EPA

Review period: ** 07/24/1997 to 7/23/2002

Date(s) of site inspection: 04/25/2002

Type of review:

☐ Post-SARA X Pre-SARA ☐ NPL-Removal only
☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead
☐ Regional Discretion

Review number: ☐ 1 (first) X 2 (second) ☐ 3 (third) ☐ Other (specify) _____

Triggering action:

☐ Actual RA Onsite Construction at OU # ___ ☐ Actual RA Start at OU# ____
☐ Construction Completion X Previous Five-Year Review Report
☐ Other (specify) _____

Triggering action date *(from WasteLAN)*: 07/23/1997

Due date *(five years after triggering action date)*: 7/23/2002

* ["OU" refers to operable unit.]
**[Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLan.]

Five-Year Review Summary Form, cont'd.

Issues:

Lack of drainage layer.

Recommendations and Follow-up Actions:

Observe cap for leaks due to lack of drainage layer. Make any necessary repairs.

Optimize ground water monitoring program and review statistical tests.

Continue addressing repairs.

Write letters to residents between Island Road and the east slope.

Address vegetative growth in the ditch system north of the culvert.

Protectiveness Statement:

The remedy is expected to be protective of human health and the environment, and in the interim, exposure pathways that could result in unacceptable risks are being controlled. Institutional controls are in place. Threats at the site have been addressed through capping of contaminated soils and landfill debris, the installation of fencing and warning signs, and the implementation of institutional controls. In addition, maintenance is being performed on a regular basis to ensure that the ground water monitoring wells, gas vents and cap remain in good condition.

Long-term protectiveness of the remedial action will be verified by the continued collection of ground and surface water samples. Current data indicates that barium is the only contaminant in ground water being detected above the MCL, however, it does not appear to be adversely impacting the Scioto River. Ground and surface water monitoring will continue on the current schedule.

Other Comments:

Encroaching vegetation from the wetlands will need to be watched. The wetlands has produced an excellent area for tree growth and this is crowding some of the mowed area but the mowed area is free of vegetation.

Bowers Landfill
Circleville, Ohio
Second Five-Year Review

I. Introduction

The purpose of the five-year review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in the Five-Year Review report. The Five-Year Review also identifies issues found during the review and identifies recommendations to address them.

Ohio EPA is preparing this Five-Year Review report pursuant to CERCLA §121 and the National Contingency Plan (NCP). CERCLA §121 states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

This requirement is further interrupted in the NCP; 40 CFR §300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

The Ohio EPA, Central District Office has conducted a five-year review of the remedial actions implemented at Bowers Landfill in Circleville, Ohio. This review was conducted from March 2002 through May 2002 and the results are documented in this report.

This is the second five-year review for Bowers Landfill. The triggering action for this statutory review is the date of the sign-off for the first five-year review report, July 23, 1997. This five-year review is required because hazardous substances, pollutants, or contaminants have been left on site above levels that allow for unlimited use and unrestricted exposure.

II. Site Chronology

Table 1: Chronology of Site Events

Event	Date
Accepted waste	1958 - 1968
Pre-NPL responses - Ground and surface water were sampled.	1980
NPL listing	September 1983
Remedial Investigation/Feasibility Study complete	1989
ROD signature	March 31, 1989
Remedial design start/complete	1990 - 1991
Superfund State Contract	July 5, 1991
Actual remedial action start	February 1992
Construction dates (start, finish)	March 1992/Spring 1993
Construction completion date	September 1993
Remedial Action Report	September 1993
Deletion from NPL	October 29, 1997
Previous five-year reviews	July 23, 1997

III. Background

Physical Characteristics

Bowers Landfill is located in Pickaway County at the junction of Island and Circleville-Florence Chapel Roads, 2.5 miles north of Circleville, Ohio (Attachment 1, Figure 1). The site lies in the Scioto River flood plain and is L-shaped with its ends abutting the river.

The landfill is approximately twelve acres in size, 3,500 feet long, about 125 feet wide and ten feet above grade. The current owner is the estate of Dr. John M. Bowers.

Bowers Landfill is located in a rural area. At the time of the remedial investigation, fifteen houses were found to be located within a half mile of the site. These homes

depended on domestic water wells for drinking water. The wells were sampled and no site related contamination was found.

Land and Resource Use

Bowers Landfill began operation in 1958 and was closed in 1968. There was no activity at the site after 1968, except for unauthorized dumping of many large items such as appliances and used tires by individuals.

The surrounding area is rural, with some residences, and ponds to the east where quarrying occurred in the past. The Scioto River is to the west and is used for boating, fishing and swimming. There are no future uses intended for the site. It is partially fenced, with warning signs, and the landfill has been capped.

The groundwater underlying the site flows towards the Scioto River. No drinking water wells are located between the landfill and the river.

History of Contamination

Information is limited regarding the type and amount of wastes that were deposited at Bowers Landfill. However, an approximation was made that the landfill contains 130,000 cubic yards of waste material.

The type of wastes disposed of at Bowers Landfill consisted mostly of residential waste collected by private haulers from the Circleville area. Beginning in 1963, the site received wastes from local industries. This continued until the landfill was closed in 1968.

Initial Response

Ground and surface water were first sampled in 1980. Three monitoring wells were installed at that time. Contamination by VOCs was detected in monitoring wells west of the landfill but not to the east. The VOCs detected were ethylbenzene, toluene and xylene.

Bowers landfill was added to the National Priorities List (NPL) in September 1983. The Potentially Responsible Parties (PRPs), E.I. Du Pont de Nemours and Company (Du Pont) and PPG Industries, Inc. (PPG), signed a consent order with Ohio EPA and U.S. EPA to conduct a remedial investigation/feasibility study (RI/FS). This was conducted from 1985 to 1989.

Basis for Taking Action

Ground water, surface water, sediment and soil were sampled at Bowers Landfill.

It was determined that exposure to contaminated ground water and soil were the principal threats to be addressed by the remedial action. Barium and benzene exceeded their Maximum Contaminant levels (MCLs) in ground water at one monitoring well. However, ground water down gradient of the landfill is not used as a drinking water source. In addition, residential drinking water wells were sampled during the RI but showed no effects from the landfill.

A risk assessment of soil contamination indicated that the hazard index (HI) of 1.0 was exceeded using a worst case scenario for ingestion of contaminated soil. The total cancer risk was 3x10E-6.

Despite the low levels of contamination found, potential future risks were possible because the landfill was poorly covered in some areas. In other areas, wastes were covered by less than a foot of soil. Another reason for proposing remedial actionwere the hazardous substances placed in the landfill and the frequent flooding of the area.

IV. Remedial Actions

Remedy Selection

The Record of Decision (ROD) was signed on March 31, 1989. The remedy selected was capping, with gas and ground water monitoring to be conducted subsequent to capping. The remedial design (RD) began in 1990 and was completed the following year. The remedial action (RA) began in 1992 and was completed in 1993.

The principal objective of the RA was to reduce the infiltration of precipitation into the landfill by installing a low-permeability clay cover on the landfill. The RA for the site included removing surface debris and vegetation from the landfill, installing a low-permeability clay cover on the landfill, constructing erosion control measures and drainage improvements, restricting site access and use, installing additional ground water monitoring wells and a gas venting system, maintaining the clay cover after construction, and monitoring ground water and surface water.

Two pre-design field investigations were conducted -1) a geotechnical investigation to evaluate the properties of potential cover materials and 2) a soil gas study to determine whether a gas venting system should be constructed.

The first investigation determined that the material in the field west of the landfill was acceptable for usage as the clay layer. The excavation pits were converted to a wetlands. This area is in the Scioto River flood plain and is frequently inundated with flood waters.

The soil gas survey indicated that a gas collection and venting system was needed as part of the landfill cover. Both methane and VOCs were detected.

During August 1990, ground and surface water sampling was conducted to determine if any changes had occurred subsequent to the last sampling event. The sampling results were helpful in determining the monitoring wells to use in the long term operation and maintenance (O&M) program.

Remedy Implementation

The following paragraphs highlight the actions taken to complete the requirements of the ROD.

Trees, brush, weeds and exposed/surface debris were removed. Most of the vegetation was burned. Old tires and appliances were decontaminated, removed from the site and properly disposed of off site. Landfilled material was kept on site and placed so that it did not interfere with the capping process.

During the RA, eight additional monitoring wells were installed. Five of these wells were placed in the area west of the landfill. The remaining three were installed off site on the west side of Island Road about 1500 feet south of the site. In addition, many of the established monitoring wells had risers attached and the areas around them mounded to make access easy during flood events. Locations of monitoring wells are depicted in Figure 2 (Attachment 1).

The gas venting system was installed in the graded layer, with the gravel layer placed around the header. Gases generated rise through the graded layer and are vented into the atmosphere.

The cover system included the following from bottom to top - graded and gas venting layer one foot thick, low permeability clay cover 2.5 feet thick, topsoil cover 3 feet thick and the vegetative cover 6 inches thick.

The erosion protection and drainage improvements were accomplished by stabilizing the slopes/promoting drainage, installing sheet piling at the ends of the landfill abutting the Scioto River, planting grass on the top and sides of the landfill, reducing the infiltration of surface water through the capping process and reconfiguring the ditch system.

Institutional controls were initiated for the landfill. These included deed restrictions and permanent easements, agricultural use restrictions and site access restrictions. Deed restrictions are included in Attachment 3.

Operation and Maintenance

The first year of O&M was overseen/conducted by U.S. EPA. The PRPs agreed to do the ground water monitoring for the first year, with U.S. EPA's contractor, PRC

Environmental Management, Inc., responsible for conducting the remaining tasks.

The specific tasks that were listed for the 30 years operation and maintenance are as follows: 1) gas monitoring, 2) ground and surface water monitoring, 3) maintenance of the landfill cap, 4) site inspections and 5) repairs.

Beginning with the second year of the O&M, the PRPs signed a consent decree with the State of Ohio in September 1996 to conduct all post-construction activities at the site. Early in the second year, the PRPs' contractor abandoned Monitoring Well P15-B because a bailer was caught at the bottom of the well. The well was replaced by Monitoring Well P15-BR.

Initially, ground water sampling was conducted on a quarterly basis and analyzed for VOCs, semi-volatile organic compounds (SVOCs) and metals. Quarterly sampling continued through 1998. In March and June of 1999, due to the lack of any organic hits, analysis of ground water was reduced to inorganics. The next sampling event occurred in April 2001 and began annual ground water monitoring of inorganics. Barium is the only constituent above an MCL. Certain other inorganics are statistically elevated compared to background. Monitoring wells P-5B, P-6B, W-7, W-11 and W-14 have three or more exceedences over background with monitoring well P-5B having six constituents over background.

When the areas are not dry, surface water continues to be sampled and analyzed in the wetlands and the east ditch twice a year. Gas monitoring for methane and VOCs occurs on a annual basis. Site inspections are currently conducted at a minimum of twice a year.

During the second Five-Year Review period, GRITS/STAT was dropped by U.S. EPA. Cummings-Riter has been using ChemStat by Starpoint Software to statistically treat the data. In addition, beginning with the September 1998 sampling event, barium has been undergoing statistical analysis using the Sheward-CUSUM control chart. This checks the current results against the established baseline.

O&M costs include ground and surface water monitoring and analysis, mowing of the cap, repairs, maintenance of monitoring wells, gas vents and fence, inspections, and cutting of brush and saplings growing on the cover. The culvert and east ditch is also kept free of vegetation to allow flow of water during flooding.

With the decreasing frequency of ground water monitoring, costs associated with operation and maintenance of Bowers Landfill have decreased as noted in Table 2. The original O&M cost estimate as obtained from the Preliminary (30%) Design Report estimated yearly costs to be $184,000. This cost was subsequently revised but the information was not found.

Table 2: Annual System Operations/O&M Costs

Dates		Total Cost rounded to nearest $1,000
From	To	
1/1/97	12/31/97	$79
1/1/98	12/31/98	$59
1/1/99	12/31/99	$53
1/1/00	12/31/00	$19
1/1/01	12/31/01	$22

V. Progress Since the Last Review

At the conclusion of the first five-year review, it was determined that the remedy was protective of human health and the environment.

Minor recommendations were made following the first five-year review. The hazardous waste warning signs on the north end were replaced and the barbed wire at the bottom of the fence along Island Road was put back in place.

The monitoring well pads periodically need to have animal burrow holes filled. As the grass has become thicker around the edges of well pads, the number and size of the burrows have decreased over the course of the past five years. Monitoring well tags have been replaced as needed.

A minor amount of trespassing was noted at the time of the first five-year review. Over the next five years, less trespassing has occurred. This is probably due to the barbed wire that a neighbor has installed around his property. The barbed wire has added extra security to Bowers Landfill by blocking two dirt roads.

VI. Five-Year Review Process

The PRPs were notified of the initiation of the five-year review through their contact, Cummings Riter Consultants, Inc. Due to the uncomplicated nature of the review, no review team was established. Diana Bynum of Ohio EPA conducted the review, including the site inspection.

During the second five years, interest dropped on Bowers Landfill. The citizens

group, ACTION, no longer required a quarterly report of activities at Bowers. The last report was sent in December 1999. As a result of that and no other community interest, it was decided that a public notice and a news release to the community would be sufficient notice for the second five-year review. The public notice was run in early March 2002 and the news release later on in the same month. A date of May 24, 2002 was given as a deadline for community input to the five-year review report. No interviews were conducted.

This five-year review picked up where the first five-year review ended. Data summary reports discussing the ground and surface water analyses were reviewed, as well as the site inspection reports. As far as applicable standards relate, barium is the only constituent that has exceeded its MCL in ground water. This MCL has not changed.

All ground and surface water data has been reviewed. At the beginning of this review period, quarterly sampling continued for ground water. As discussed above, ground water monitoring was subsequently reduced both in parameters analyzed for and the frequency of sampling. At the end of this five-year review period, annual sampling is being conducted for ground water analysis of metals and semi-annual for surface water for metals analysis.

Barium was the only constituent detected over its MCL (2000 ug/l) and this was at one monitoring well, P-5B. As a result of the excedence, an additional statistical tool was applied to the data. This was the Shewart-CUSUM Control Chart.

Some other inorganics are above background but have not significantly increased since the beginning of monitoring. There are no MCLs for these constituents.

A site inspection was conducted on April 25, 2002 by Diana Bynum, Ohio EPA, and attended by Mike Lambert, Cummings Riter Consultants, Inc. A thorough site inspection was conducted. The monitoring wells, bumper posts, pads and gas vents were inspected. The grass cover, sheet piling and fencing were checked, as well as the two areas that were repaired due to erosion of the cover.

One erosional hole was noted in the cover at the north end and will be filled in. It was noted by Cummings Riter in March 2002 that clear water was running from this hole are approximately the rate of 5-10 gallons per minute. They have checked back to obtain a sample of this water for analysis but have not been successful because the seep was dry. The hole may be the result of the lack of a drainage layer at the clay layer/topsoil layer interface. During heavy rains, precipitation may mound and break through the cover to the outside. See Figure 2 (Attachment 1) for the location of the seep.

A minor amount of trespassing was noted in the past. None was noted during

this site inspection, however, it appears that someone was using one of the gas vents for target practice. The pinged side of the gas vent was facing the residences at the top of the east slope and may have been from a pellet gun. Trespassing appears to have been reduced after a neighbor put up barbed wire around his property. This has provided additional security to the Bowers site.

Trees and shrubs are crowding the sides of the landfill and the mounds leading to the down gradient monitoring wells in some areas. The cover itself is clear of brush and saplings.

The area north of the culvert and east ditch will need to be cleared of brush and saplings this summer. The access road to the landfill is in good condition.

The wetlands/ponds are well covered in vegetation. The inlets to the ponds from the Scioto River are in good condition and are free of vegetation. Some erosion had occurred in the past but only once and was not observed to be a current problem. Sediment from the river has been deposited in the ponds during flood events.

The sheet piling, monitoring wells, gas vents and fence are in good condition. Some bumper posts need new caps and some gas vents will need spacer replacement this year. A minor amount of repainting is needed. The grass cover is also in good condition. Repairs are done as needed but have been minor - such as repainting of wells and gas vents, correcting areas of erosion and filling in animal burrow holes.

VII. Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

The remedial action is operating and functioning as designed. The capping of the landfill continues to achieve the containment of waste and the prevention of the migration of precipitation to ground water. Institutional controls are in place and have prevented ready access to the landfill and remain protective. Fencing is in good condition and the warning signs are in place.

Operation and Maintenance has been effective. Animal burrowing occurs around some of the monitoring well pads but appears to be lessening as the grass becomes thicker. These burrows are shallow and are filled with soil and reseeded after discovery. The grass cover is well maintained. Maintenance activities such as painting of monitoring wells are conducted when needed.

Due to the barium concentrations in Monitoring Well P-5B being above the MCL, Cummings Riter took additional measures with the approval of Ohio EPA. They re-developed the monitoring well and used a conservative mass loading calculation to show

that the concentration of barium was not impacting the Scioto River. The re-development of the monitoring well did not lower the concentration of barium below the MCL. The analysis involved the use of a conservative mass loading calculation that assumed ground water contamination at Monitoring Well P-5B contributed base flow to the Scioto River. The analysis was reviewed by Ohio EPA and it was agreed that the barium concentration was not adversely impacting surface water.

In November 1998, it was discovered that part of the fencing east of the Monitoring Well Cluster 12 was buried under a levee by the neighbor mentioned previously. The fence was on his property but was not part of the fencing installed during the RA. At the same time, the neighbor installed barbed wire to the south, east and north of the quarry ponds that are east of Monitoring Well Cluster 12. The neighbor was considering developing the ponds for stocking with fish. The newly installed fencing cut off more of the area than the previous fencing so it was decided by Ohio EPA, in conjunction with U.S. EPA, that the buried fencing did not need to be replaced.

There have not been large variances in O&M costs. As the monitoring well sampling has gone from quarterly to yearly, there has been a corresponding drop in costs.

The Ohio EPA Division of Drinking and Ground Waters (DDAGW) will be tasked to do an optimization study to be conducted later on this year. One monitoring well has barium over the MCL. Some of the other wells could possibly be abandoned because they are no longer needed. The statistical tests will also be reviewed.

There may be a future problem due to the lack of a drainage layer between the clay layer/topsoil layer. So far, one erosion hole has occurred but is small and can be readily patched. The erosional areas that were repaired were at the ends of the landfill.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAGS) used at the time of the remedy selection still valid?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy.

There have been no changes in standards or to be considereds for Bowers Landfill.

Land use has not changed near the landfill. No new exposure pathways or receptors have been identified. The remedy is progressing as expected.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No additional information was discovered to call into question the protectiveness of the remedy.

Technical Assessment Summary

According to the data reviewed and the site inspection, the remedy is functioning as intended. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. Barium concentrations in ground water have not been reduced but they are detected in one monitoring well and appear not to be impacting surface water. There have been no changes in the MCL for barium. Other substances that have been detected are not a concern. There is no other information that calls into question the protectiveness of the remedy.

VIII. Issues

Table 3: Issues

Issues	Affects Current Protectiveness (N/Y)	Affects Future Protectiveness (N/Y)
Lack of drainage layer.	N	It may

IX. Recommendations and Follow-up Actions

Table 4: Recommendations and Follow-up Actions

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (N/Y)	
					Current	Future
1	Observe cap for leaks due to lack of drainage layer.	PRPs	Ohio EPA	Ongoing	N	It may.
2	Optimize ground water monitoring program and statistical tests.	Ohio EPA	Ohio EPA	12/31/02	N	N
3	Address vegetation in the ditch system	PRPs	Ohio EPA	Ongoing	N	N
4	Write letters to residents between Island Road and the east slope	Ohio EPA	Ohio EPA	12/31/02	N	N
5	Continue addressing repairs	PRPs	Ohio EPA	Ongoing	N	N

X. Protectiveness Statement

The remedy is expected to continue to be protective of human health and the environment. Exposure pathways that could result in unacceptable risks are being controlled. Institutional controls are in place. Threats at the site have been addressed through capping of contaminated soils and landfill debris, the installation of fencing and warning signs, the implementation of institutional controls, drainage improvements and the installation of sheet pilling to control erosion. In addition, maintenance is being

preformed on a regular basis to ensure that the monitoring wells, gas vents and cap remain in good condition.

Long-term protectiveness of the remedial action will be verified by the continued collection of ground and surface water samples. Current data indicates that barium is the only contaminant above the MCL, however, it does not appear to be adversely impacting the Scioto River. Ground and surface water monitoring will continue on the current schedule.

XI. Next Review

The next five-year review for Bowers Landfill is required five years from the signature date of this review.

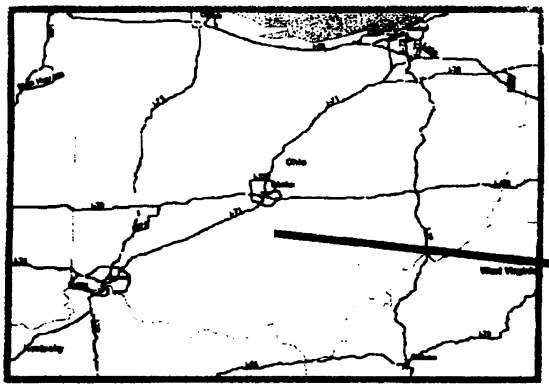
ATTACHMENTS

ATTACHMENT 1

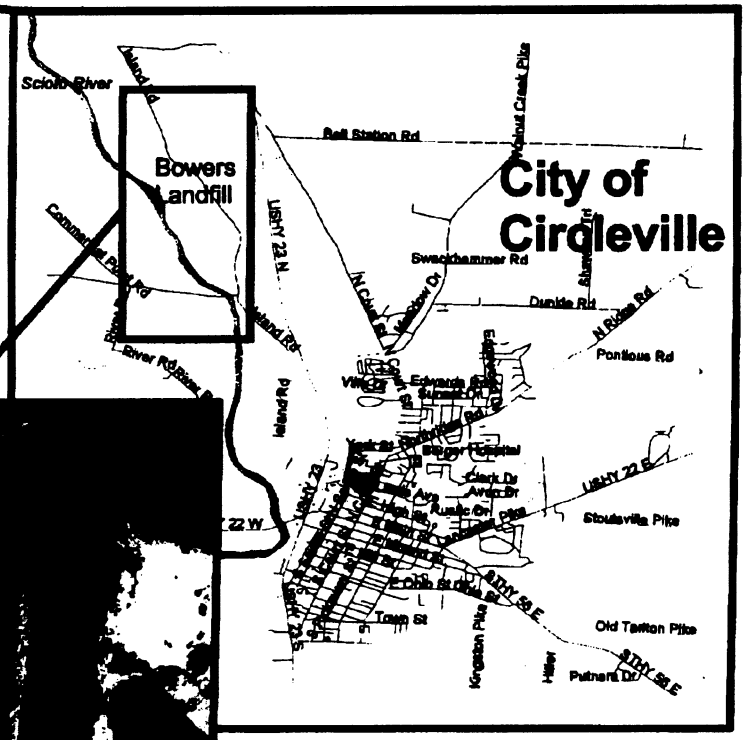
Site Maps

Location of the Bowers Landfill Superfund Site Circleville, Ohio

1) State of Ohio



2) City of Circleville



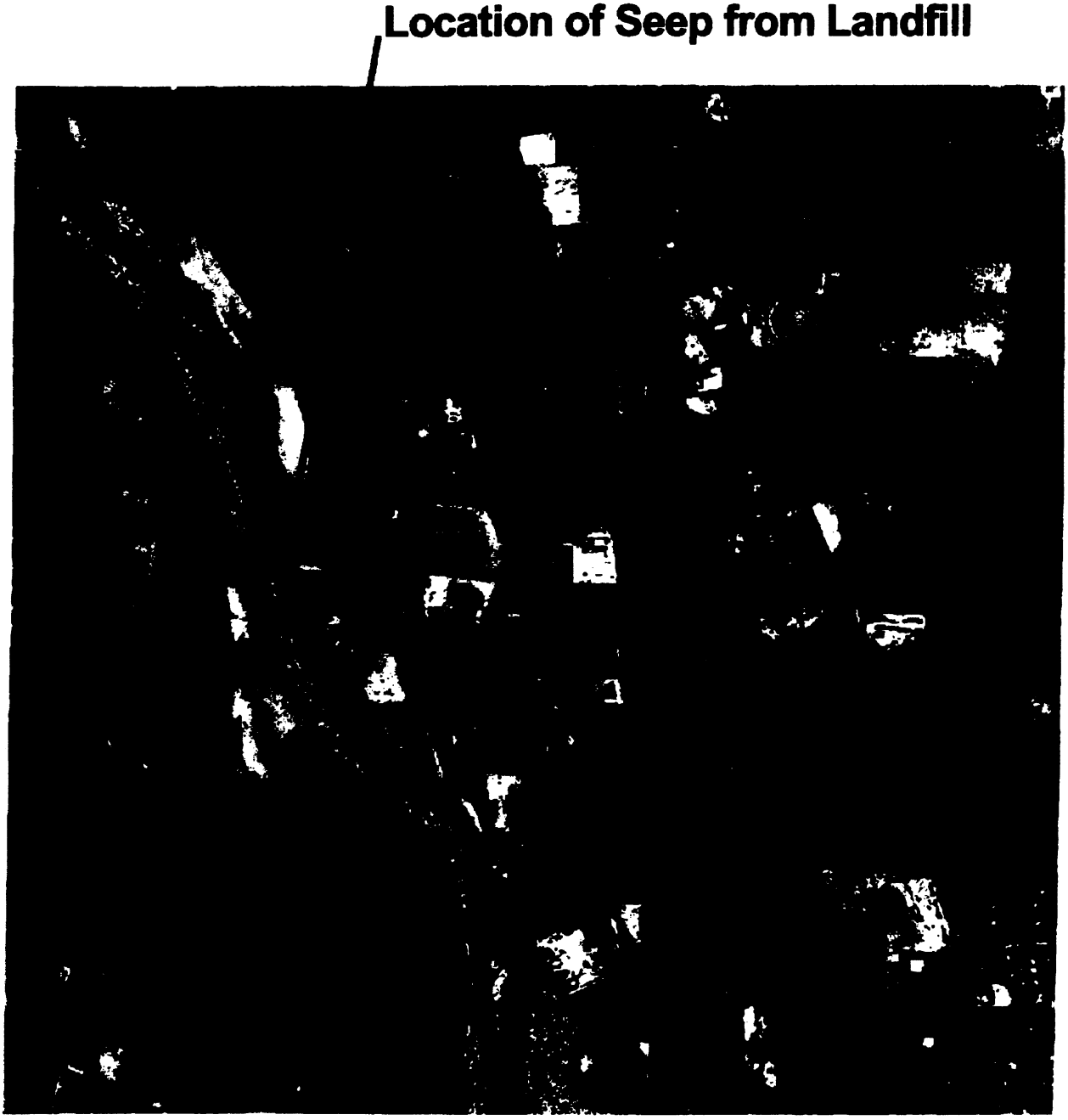
3) The Bowers Landfill Superfund Site

4) The Landfill

Figure 1

Plot created by David Wilson
US EPA Region 5 on 7/30/02
Image Date: 7/4/1993

Bowers Landfill Circleville, Ohio



Plot created by David Wilson US EPA, Region 5 on 7/30/02
Image Date: Unknown

Figure 2 Monitoring wells ⊕

Bowers Landfill Superfund Site Circleville, Ohio
3D Surface Terrain Model of Landfill and Wetlands

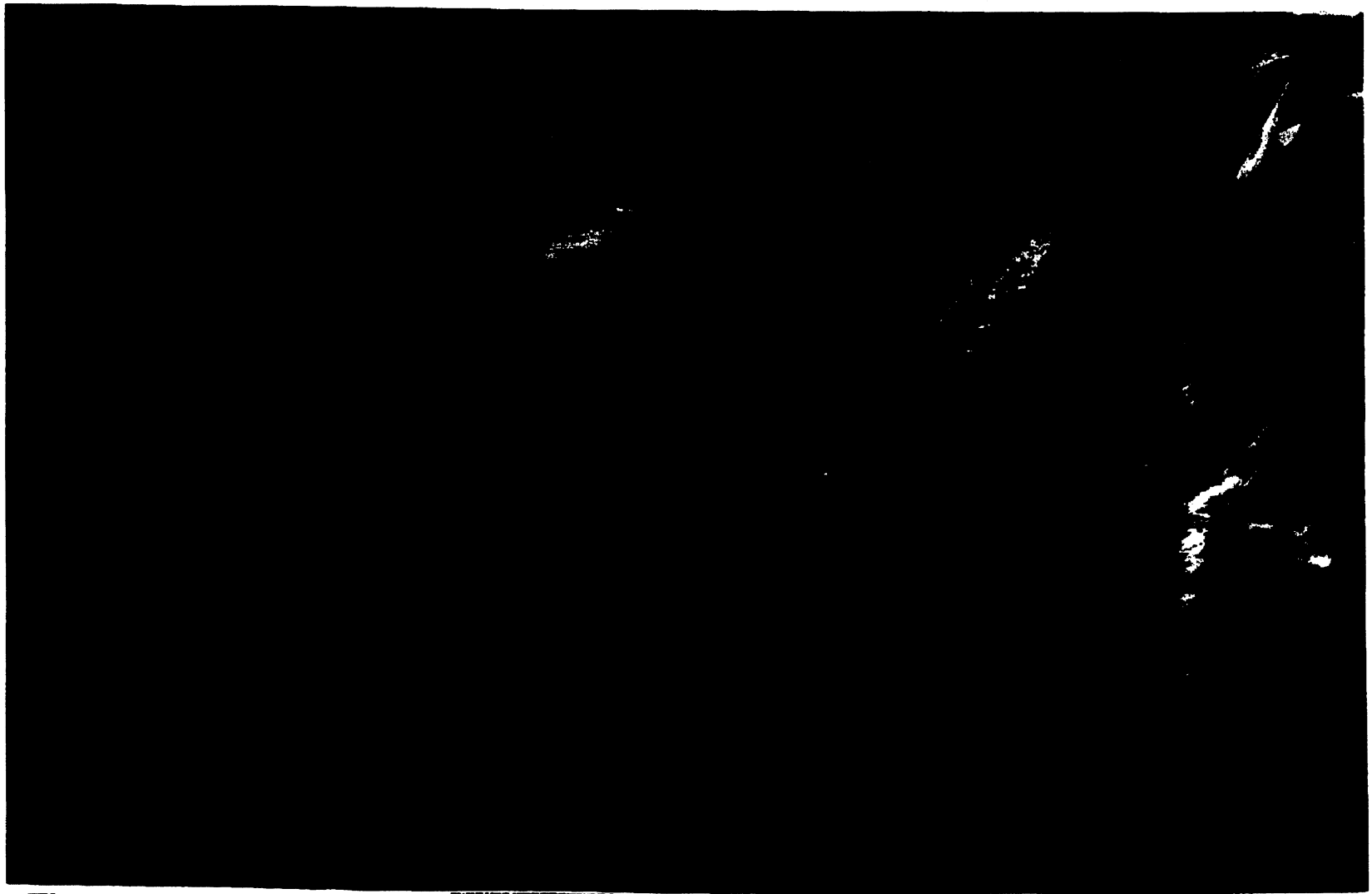


Figure 3

Plot created by David Wilson US EPA, Region 5 on 7/30/02
Image Date: 7/4/1993

ATTACHMENT 2

List of Documents Reviewed

Bowers Landfill Work Plan Groundwater Monitoring/Operations and Maintenance Plan, March 6, 1996.

Data Summary Report, Phase III Monitoring Program, Year 6, June 2001.

Data Summary Report, Phase III Monitoring Program, Year 5, June 2000.

Event 12 Data Submittal and Data Summary Report, Phase II Monitoring Program, August 1999.

Preliminary (30 percent) Design for Bowers Landfill, November 1990.

Quarterly Groundwater Sampling and Analysis, Phase II, Event 11 Data Submittal, May 1999.

Quarterly Groundwater Sampling and Analysis, Phase II, Event 10 Data Submittal, January 1999.

Quarterly Groundwater/Surface Water Sampling and Analysis, Phase II, Event 9, October 1998.

Quarterly Groundwater/Surface Water Sampling and Analysis, Phase II, Event 8, June 1998.

Quarterly Groundwater/Surface Water Sampling and Analysis, Phase II, Event 7, April 1998.

Quarterly Groundwater/Surface Water Sampling and Analysis, Phase II, Event 6, January 1998.

Quarterly Groundwater and Surface Water Sampling and Analysis, Phase II, Event 5, September 1997.

Quarterly Groundwater and Surface Water Sampling and Analysis, Phase II, Event 4, June 1997.

ATTACHMENT 3

BOWERS DEED RESTRICTIONS

The record owner, Ellen J. Bowers as Executrix for the Estate of John N. Bowers ("Owner"), hereby imposes restrictions on the real property, which real property includes the Bowers Landfill Superfund Site and adjacent property, and which real property is located in rural Pickaway County, Ohio, approximately 2.5 miles north of the City of Circleville, Ohio (hereafter "the Real Property"). The Real Property is more fully described as follows:

Situated in the Township of Circleville, County of Pickaway, State of Ohio and being part of Fractional Section 3, Township 4, Range 22 bounded and described as follows:

Being part of the residue of the 202 acres and 4 pole tract conveyed to John N. Bowers by deed recorded in Deed Book 156, Page 339 in the Pickaway County Recorder's Office.

Beginning at a 1/2" rebar found in the North line of section 3 being Northwest corner of a 3.16 acre tract of S. & D. Properties, Inc. and said to be 931.52 westerly from the point of intersection of the North line of Section 3 with the centerline of Island Rd; thence with the West line of said 3.16 acre tract S7˚20'49"E. 156.34 feet to an iron pin found at the Southwest corner to said 3.16 acre tract; thence on a new line S17˚15'58" E. 526.56 feet to an iron pin found at the corner of S. & D. Properties, Inc. 6.449 acre tract; thence with the West line of same S14˚24'57" E. 627.23 feet to an iron pin found at the Southwest corner of said 6.449 acre tract; thence with nine new lines through said tract the following calls; S13˚40'48" E. 340.79 feet to an iron pin set; thence S25˚38'10" E. 134.52 feet to an iron pin set; thence S11˚26'06" E. 426.80 feet to an iron pin set; thence S21˚27'56" E. 494.61 feet to a 3" steel fence post; thence N59˚07'19" W. 734.20 feet to an iron pin set; thence N74˚32'05" W. 288.44 feet to an iron pin set; thence N46˚51'53" W. 395.10 feet to an iron pin set; thence N29˚16'27" W. 1220.48 feet; thence N 17˚32'23" W. 917.67 feet to a 1/2" x 15" long bolt found on the East bank of the Scioto River being in the North line of Section 3 and the above referenced 202 acres and 4 pole tract; thence with said North line S87˚07'10" E. 1334.66 feet to the place of beginning. Containing 60.404 acres, more or less. Subject to all existing valid rights-of-way of record.

The following restrictions are imposed upon the Real Property, its present and any future owners (including the heirs to the Estate of John N. Bowers), their

authorized agents, assigns, employees or persons acting under their direction or control, for the purposes of protecting public health and the environment, preventing interference with the performance and the maintenance, of any response action selected and/or undertaken by the United States Environmental Protection Agency ("U.S. EPA"), or any action under the oversight of U.S. EPA and/or the Ohio Environmental Protection Agency ("OEPA"), pursuant to Section 104 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA), 42 U.S.C. Section 9601 et seq. Specifically, the following deed restrictions shall apply to the Real Property:

A. There shall be no consumptive or other use of the groundwater underlying the Real Property that could cause exposure of humans or animals to the groundwater underlying the Real Property;

B. There shall be no use of, or activity at, the Real Property that may interfere with, damage, or otherwise impair the effectiveness of any response action (or any component thereof, including, without limitation, operation and maintenance of such response action) selected and/or undertaken by U.S. EPA and/or Ohio Environmental Protection Agency (Ohio EPA), or any party acting under the oversight of U.S. EPA and/or Ohio EPA, except with the written approval of U.S. EPA, and Ohio EPA, and consistent with all statutory and regulatory requirements;

C. There shall be no residential, commercial, agricultural or recreational use of the Real Property including, but not limited to, any construction of residences, excavation, grading, filling, drilling, mining or other construction or development, farming, placing of any waste material at any portion of the property or any other activity. Upon the written request of Owner, the Ohio EPA, in its unreviewable discretion, may provide written permission to Owner for recreational use of the Real Property, subject to any limitations established by Ohio EPA, provided that no permission allowing a use shall override a prohibition against such use established by the U.S. EPA, or otherwise established by federal, state or local law.

D. There shall be no use of the Real Property that would allow the

continued presence of humans at the Real Property, other than any presence necessary for implementation of any response actions (or any component thereof, including, without limitation, operation and maintenance of such response action) selected and/or undertaken by U.S. EPA and/ or the Ohio EPA, or any party acting under the oversight of U.S. EPA and/ or OEPA, including such response actions taken by other responsible parties under a judicial or administrative order. A prohibited use of the Real Property includes, but is not limited to, recreational use;

E. There shall be no installation, removal, construction or use of any buildings, wells, pipes, roads, ditches or any other structures or materials at the Real Property except as approved, in writing, by Ohio EPA and U.S. EPA; and

F. There shall be no tampering with, or removal of, the containment or monitoring systems that remain on the Real Property as a result of the performance of any response action (or any component thereof, including, without limitation, operation and maintenance of such response action) which is selected and/or undertaken by U.S. EPA and/or the Ohio EPA, or any party acting under the oversight of U.S. EPA and/or OEPA

The obligation to implement and maintain the above restrictions shall run with the land and shall remain in effect until such time as the Ohio EPA files with the Court a written certification stating:

1. The response action required at, under or adjacent to the Real Property by any consent decree or judicial or administrative order, entered pursuant to CERCLA, has been fully performed;

2. No other response actions are planned for the Real Property; and

3. The above restrictions are no longer necessary to meet the purposes of the consent decree filed in State of Ohio ex rel. Betty D. Montgomery v. E.I. DuPont De Nemours and Company, et.al, Case No. C2 96-783, United States District Court for the Southern District of Ohio.

FOR THE ESTATE OF JOHN N. BOWERS:

ELLEN J. BOWERS, as Executrix of The Estate of John N. Bowers

IN WITNESS WHEREOF, has caused these Deed Restrictions to be executed this 16th day of October, 1996.

STATE OF OHIO, PICKAWAY COUNTY Sworn to and subscribed before me, a Notary Public in and for said State and County this 16th day of October, 1996

NOTARY PUBLIC STATE of Ohio
MY COMMISSION EXPIRES: